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ABSTRACT

Conducted as part of a larger study, this study attempted to describe and compare academic achievement of students who intended to enter selected faculties (education, engineering, arts and sciences) of the University of Regina (Canada) in the fall of 1982 and 1983 and who graduated from Saskatchewan high schools. This group totaled 3,632 of whom 2,663 were accepted by the university. Data were collected on the following variables: birth date, gender, faculty year of entry, high school graduation date, high school location, grades in selected high school courses, and grade point average (GPA). For purposes of comparison, the population was divided by year of entry and by faculty selected. Results are presented in tabular and narrative form. It is concluded that students intending to enter the Faculty of Education demonstrated lower overall academic performance, based on high school grades. Although overall GPAs for the entire population were above average, the achievement of education applicants is lower than their college-bound peers. (KM)

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University of Regina

A Comparison of the Academic Achievement of Saskatchewan High School Graduates Who Intended to Enter Selected Faculties at the University of Regina, 1982 and 1983

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A Comparison of the Academic Achievement of Saskatchewan High School Graduates Who Intended to Enter Selected Faculties at the University of Regina, 1982 and 1983

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June, 1985

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Chapter I

INTRODUCTION

Teacher education programs and practising school teachers have been severely criticized in the popular press in recent years. Declining Scholastic Aptitude Test (SAT) scores in the United States and indications of lower scores on other ability measures such as science knowledge have fueled back to basics movements in many regions of North America. Allegations concerning education students' weak academic standing, particularly in comparison with arts and sciences majors, have aroused feelings of indignation among education professionals, but seldom have these criticisms been refuted with hard data. There are some encouraging indications that tnese criticisms are about to be addressed.

A review of research studies on the academic performance of individuals who intend to enter teacher education has provided new evidence which should be examined by teacher training institutions. For example, a relationship appears to exist between academic performance and teaching ability. A number of studies have found that academically talented teachers tend to leave tne classroom in greater numbers than their less academically able colleagues. Other findings have indicated that teaching attracts and retains those with low measured academic ability. Results also raise questions about gender differences and the influence of rural or urban background on prospective teachers. Clearly, more research is required.

Almost all of the published reports which compare the academic abilities of education and noneducation students originate in the United States so that the relevance of this literature may be questioned in the Canadian context. The American literature appears to illustrate what can happen when people fail to attend to a relationship such as that between academic success and teaching ability and thus the American experience is meaningful in any context. There is some indication that related information may exist as "in-house" Canadian university or government documents. However, the results are not readily available on research data bases.

PURPOSE

Given the allegations concerning the academic ability of students who choose education as a career, research results which, although few in numbers, tend to support these claims, and given the paucity of published Canadian educational research in this area, this study attempted to compare the academic performances of education and noneducation applicants at the University of Regina.

More specifically, the study was designed to:

a) obtain demographic data on students who have been given student numbers (an indication of their intent to enter specific faculties at the University of Regina);

b) determine academic profiles of students entering the University of Regina from Saskatchewan high schools; and

c) compare academic performance (based on selected high school subject grades) of students who intended to enter education, engineering, arts, and science faculties at the University of Regina in fall semesters, 1982 and 1983.

BACKGROUND

In an attempt to address persistent criticisms levelled against teachers and teacher preparation programs, this study was intended initially to profile characteristics of education graduates as part of a broad examination of potential attributes of effective teachers. Availability of data in university records provided the stimulus to divide the larger study into manageable phases consisting of baseline data comparisons, perceived nonacademic attributes, and case study profiles.

The initial phase, reported in this study, attempted to describe and compare academic abilities of students who intended to enter selected faculties of the University of Regina in fall semesters 1982 and 1983 and who graduated from Saskatchewan high schools. Although data has been collected on all students, including out-of-province and University Entrance Program (UEP)*, the population was delimited in anticipation of comparisons in subsequent phases of the study. The 1982 and 1983 student entry points were selected because those

* The University Entrance Program at the University of Regina, hereafter referred to as UEP, permits mature students to enter courses and programs without academic qualification.

students who actually entered various programs of study and those students who continue in these courses of study to graduation will be present for interviews and case studies in later phases of the study. Potential graduate student research studies in areas related to personality and employment profiles--research which requires available subjects--was also anticipated.

Thus, the current study must be conceptualized within a much wider framework of research. It was designed to provide baseline data for an interrelated cluster of future research activity which will attempt to provide a clearer picture of education students academic and nonacademic attributes as well as a more valid and reliable basis for comparison between education and noneducation student profiles.

Chapter II

LITERATURE REVIEW

Concern about the quality of education, which ebbs and flows in inevitable cycles (Cross, 1984), appears to be once again on the rise. Not since the mid-1960's have public school teachers encountered such hostility toward the quality of their work (Rosenholtz, 1985). Recent articles in widely-distributed, newstand-type periodicals such as Time magazine (e.g. "Help! Teacher Can't Teach"; cover story, June 16, 1980) pique public interest. Nothing stimulates public interest more than exciting headlines which hint of scandal or crisis.

Until recently, much of this sensationalizing was largely disregarded because the sweeping generalizations about purported inadequancies could not, upon close examination, be substantiated. This attitude is slowly changing. Attacks on teachers and teacher education are now more sophisticated, contain research data to support claims, and are multifaceted. For example, during the most recent attack on teachers, educational researchers have disclosed several alarming problems with the teacher workforce. Among the most urgent of these problems is the need to encourage young people with academic talent to take up a career in teaching (Rosenholtz, 1985) and the inability of the profession to retain its most academically talented teachers (Schlechty and Vance, 1981). The seriousness of this situation is underscored by studies showing a strong relationship between teachers' academic talent and students' learning (Levin, 1970; Murnane and Phillips, 1978; Summers and Wolfe, 1977).

According to Weaver (1983) fewer than half of the teacher education graduates in 1976 had Scholastic Aptitude Test (SAT) scores as high as the average high school senior's score four years earlier. In 1982, the average SAT scores of prospective teachers on the verbal and mathematics subtests were, respectively, 32 and 48 points below the average scores of those who intended to enter other fields.

Historically, comparisons of this sort were more difficult - SAT scores were generally not available before 1970. However, Weaver (1984) documented comparisons that were attempted. Learned and Wood (1938) compared test scores of teacher candidates with those of other college majors and of high school students. They found that achievement and aptitude test scores were highest among students enrolled in university-based teacher education programs, next highest among students enrolled in teacher education programs at four-year colleges, and lowest among those enrolled in such programs at two-year institutions. The combined average score of sophomore education majors in all three kinds of post-secondary institutions fell below the score of other college majors; the prospective educators ranked between the 40th and 50th percentiles. At the senior level, the average test scores for education majors were very close to the mean for all college seniors. Physicians and ministers had similiar rankings in 1928; journalists and engineers scored much higher in the 1932 scores that were examined. Men (about one-third of all the education majors) had a significantly higher average test score than the college average; their performance compared favorably with that of students in other professions. However, women in education had a

lower average score than their counterparts in other majors.

On "progress" tests (which measure growth in achievement between the sophomore and senior years in college), the education majors outperformed the arts majors but not those students preparing to enter the professions. The median score of the total group of prospective teachers was nearly double the median score of high school seniors.

Thorndike and Hagen (1959) found that male Aviation Cadet candidates who subsequently entered teaching were clustered in the middle range of occupational groups with respect to both verbal and quantitative aptitude. Secondary mathematics and science teachers and elementary teachers tended to be near or above the average scores of Aviation Cadet candidates, who were somewhat better than the general population of airmen, while secondary English and social studies teachers were about half a standard score below the mean. Other high school teachers scored at the mean.

Dael and Wolfe (1954), who studied 41 colleges and universities for the Commission of Human Resources and Advanced Training, as well as several institutional studies, conducted in various years prior to 1954, and 1,951 scores of the Selective Service College Qualification Test, published results comparable to Thorndike and Hagen. Education majors in general and those who majored in the social sciences, business and commerce, and agriculture clustered at about the 44th percentile, whereas education students who majored in the sciences and engineering scored well above the mean for all college graduates.

Povalko (1970) followed female high school graduates from their graduation in 1957 until 1964. He found that women who entered

teaching were over-represented in the upper one-third and under-represented in the lower one-third of intellectual ability scores. These findings contrast sharply with those of Learned and Wood (1938) and Bethune (1981) whose studies concluded that females intending to enter teaching were very weak academically.

The large 1960's U.S. government-funded study which compared test scores of education majors with students majoring in other fields concluded that, among white college students, future teachers tended to score as well as majors in other fields on tests of verbal and nonverbal reasoning, mathematics, science, social studies, and fine arts. Among black college students the academic superiority of nonteachers over future teachers was substantial. But in general future teachers were slightly above the typical 12th-grade student in academic performance and commitment (Coleman, 1966).

Accordingly, Weaver (1984) concluded that, prior to 1970, it could not be demonstrated that most new teacher applicants were significantly lower than the average student in terms of academic ability.

The issue which appears to have stimulated recent concern is that research evidence since 1970 suggests intellectual ability of teacher applicants is below that of their peers. Such concern is understandable if there is a relationship between teachers' ability and students' learning as some researchers contend.

For example, Levin (1970) suggested that each additional point scored by teachers on the SAT verbal subtest adds 0.175 points to the verbal scores of black students and 0.179 points to the verbal scores of white students. He also indicated that there is a correlation

between ability and attrition among newly recruited teachers. Levin estimated that it would be ten times more cost effective to spend funds on recruiting and retraining verbally proficient teachers than to use the money to pay for years of experience in the classroom, given that the desired outcome is better student achievement.

In 1981, Schlechty and Vance reported that there was considerable evidence that those who chose to major in teacher education were, as a group, less academically able than most other college majors (Weaver, 1979). There was evidence that graduates of teacher education institutions are not as academically proficient as most other categories of college graduates (Koerven 1963; Weaver, 1979). There was even some evidence that some teacher education graduates did not perform as well on tests of academic achievement as do many of the students they intend to teach. This research was based on a North Carolina sample (N=32,131) of teachers who scored high or low on existing measures of academic ability and who entered teaching during the years 1973 to 1980. The results indicated that, as a group, those who entered teaching in North Carolina scored lower on measures of academic ability than did perspective teachers in the recent past. Also, there was a strong negative relationship between measured academic ability and retention in teaching.

Vance and Schlechty (1982) followed this regional study with a larger, more representative examination of certain data recorded in the National Longitudinal Study of 1972 High School Seniors (in the U.S.A.). A subgroup of 4,416 college graduates was grouped on the basis of SAT (math and verbal subtest) scores into five relatively

equal groups. The results indicated that teaching was more attractive to those individuals with low measured academic ability than to those with high measured academic ability. For example, 15.05% of the noneducation applicants were in the lowest rank compared with 29.83% of the education applicants. Moreover, 21.92% of the noneducation applicants were in the highest rank, compared with only 10.21% of education applicants. Education did attract a proportionate share of the middle ranks. But education attracts more than a proportionate share from the lowest two ranks and less than a proportionate share from the top two ranks. The pattern persisted regardless of race or sex and closely resembled the earlier North Carolina study.

Vance and Schlechty (1982) discuss criticisms of the above evidence which argue that there is no demonstrated causal link between measured academic ability and teacher competence. They do not take the position that all or even most individuals who score high on measures of academic ability could become competent teachers (how ever teacher competence is measured). Nor do they suggest that those who score poorly are foreordained to the ranks of the incompetent. They do suggest that, whereas high scores on measures of academic ability may not assure competence, scoring low on such measures does not give one an advantage over the competition. It seems reasonable to suppose, as the evidence indicates (Bowles and Levin, 1968; Coleman, 1966; Guthrie, 1971; Hanushek, 1970), that competence in teaching requires a level of intellectual ability that is at least equal, if not superior, to that of the average college student. Although efforts to establish firm relationships between teacher

characteristics and student achievement have not been notably successful, Brophy (1982) indicates that effective teachers engage in highly complex teaching activities requiring considerable capacity to plan, to organize and allocate classroom time, and to suspend judgement. Teachers able to function in this way tend to be drawn disproportionately from among the most academically able of those who teach. Brophy (1982) found, as others have, that all other variables being equal, demonstrated intellectual ability is an advantage in the classroom.

Standardized test scores of teachers declined somewhat more sharply between 1972 and 1980 than the U.S. national average. Scores among women in teaching have declined in particular (Peng, 1982; Robinson, Keith, and Page, 1983). Apparently research results such as those illustrated coupled with reports in the popular press of problems in teaching and in teacher education, have encouraged serious examination of admission standards and quality control in U.S. teacher training institutions.

In addition, U.S. National Council for Accreditation of Teacher Education standards for accrediting teacher preparatory institutions are really a "mess" (Tom, 1980). According to Sykes (1983), this downward shift in the academic distribution of teachers will affect the quality of teacher training. Those universities with high entrance requirements and high academic standards will no longer have many students who wish to prepare for teaching. Those institutions with open admission will continue to train as teachers a large number of low ability students who lack other options. Meanwhile teacher education programs in moderately selective institutions will be forced

to accept a greater proportion of students who rank just above minimum standards for admission.

In summary, the literature indicates that the most effective teachers seem to be among the most academically able of those who teach. However, since 1970, education students have attained lower scores on standardized tests, have lower high school graduation averages, and are less academically able or proficient than their peers who enter other faculties.

It may be argued that, in the United States, where teachers receive lower salaries and are perceived at a lower status level relative to other professionals, the teaching profession attracts less academically capable individuals. Research results are perhaps meaningful only in that context and may not apply to Canadian teachers. However, the research questions which examine the relationships between academic performance and teaching ability are universal. That these questions have not been widely studied in Canada is puzzling. Given the concern about teacher quality and the public demand for accountability in all professions, these research questions demand wide examination in the Canadian context.

Chapter III

PROCEDURE

From a total of approximately 6,000 students who registered to enter the University of Regina for the first time in 1982 and 1983, a subgroup of 3,632 Saskatchewan high school graduates was identified for the study. This represented the entire population of high school graduates who received student numbers during those semesters. Of these Saskatchewan graduates, 2,663 students were accepted. Descriptive statistics were computed into faculties which were investigated in this study based on the following variables: birth date (five age categories based on birth date), gender (male/female), faculty (refers to faculty requested on the application form), year of entry (1982 or 1983), high school graduation date, high school location (for rural-urban comparison), grades in high school courses (English 30A, English 30B, Algebra 30, Geometry-Trigonometry 30, Chemistry 30, Physics 30, BSCS Biology 30, French 30, and Social Studies 30), and grade 12 average. The population was divided by year of entry (1982 or 1983) and by faculty selected (education, arts, science or engineering) for purposes of comparison.

Three university students collected the indicated data from the files of the Registrar at the University of Regina during the summer of 1984. Because student numbers were recorded with the data, accuracy of recording could be monitored. In December, 1984, a reexamination of the recorded Physics 30 scores revealed a high degree of recording accuracy. The recorded data were analyzed by the use of standard statistical measures (Statistical Package for the Social Sciences - SPSS).

Chapter IV

RESULTS

The data presented in the following tables summarize the analysis of academic performance of Saskatchewan high school graduates who indicated their intention to enter the University of Regina in 1982 and 1983. This means that high school grades were received by the Registrar, that a file was created, and that a student number was issued to each individual. Detailed investigation of students who actually entered this university, attended classes, and followed a particular program is the subject of another study.

All students who intend to enter the University of Regina must apply to register with a specific faculty and although data were collected on all students, this study compares student performance in high school on the basis of chosen faculty. The data summarized in the tables compare the academic performance of students applying to enter selected faculties. It was assumed that valid comparisons of ability levels of groups of students could be made on the basis of academic performance in high schools. The literature supports this assumption.

Table 1 provides introductory academic and demographic data for Saskatchewan high school graduates who applied for admission into selected faculties at the University of Regina in 1982 and 1983.

The figures for 1982 closely match those for 1983, both in terms of student grades by faculty and numbers of male and female or rural and urban students. In Faculties of Engineering and Science the

Table 1

Student Academic and Demographic Information by Faculty for Saskatchewan High School Graduates Applying to the University of Regina, 1982 and 1983

Faculty		Grade 12 Average			Males (N)	Females (N)	Rural (N)	Urban (N)
		All	Male	Female				
Education	1982	71.68	68.46	72.69	54	173	92	135
	1983	71.97	68.99	72.95	63	192	95	160
Engin[a]	1982	80.04	79.36	83.88	90	16	27	79
	1983	81.01	80.75	84.80	72	5	24	53
Arts	1982	73.82	71.99	75.00	237	367	160	444
	1983	74.46	72.20	76.00	254	371	151	474
Science	1982	76.46	75.24	78.09	236	177	127	286
	1983	75.85	74.54	78.02	220	133	111	242
Total Sample	1982	73.01	71.79	74.03	826	987	564	1249
	1983	72.59	71.33	73.65	825	993	571	1247

[a]Engineering

male/female proportions are considerably different than in arts and education. However, similarity of rural-urban proportions are found in all four selected faculties at this university.

Table 2 displays the means and standard deviations for selected high school courses of Saskatchewan high school graduates who applied to enter the University of Regina in 1982 and 1983.

Several points are evident. English 30 is an entrance requirement of all faculties at the University of Regina. Thus, frequency counts for this subject provide a fairly accurate representation of numbers of Saskatchewan high school graduates who apply to enter this university. Approximately 3,000 students applied to enter the University of Regina in both 1982 and 1983. One-third of these were UEP students and/or high school graduates from other provinces. The number of entering Saskatchewan graduates was consistent overall and within subjects from one year to the next. The means in various subjects were consistently within the 72% to 75% range. GPA or grade 12 average on all subjects taken by approximately 1,800 students each year varied less than one-half a percentage point.

Table 3 displays the percentage of entering Saskatchewan high school graduates in each grade category for selected high school courses by faculty chosen. Although data were collected for the entire population of entering students, comparisons were restricted to students selecting to enter Faculties of Education, Engineering, Arts, and Science. Some faculties permit entry only after completion of one or more years or arts or science (e.g., administration, social work).

Table 2

Mean and Standard Deviation of Selected High School Courses for Saskatchewan Graduates Applying to the University of Regina in 1982 and 1983

Course[a]		N	Mean	S.D.
Eng 30A	1982	1782	72.48	10.59
	1983	1767	71.85	10.83
Eng 30B	1982	1764	72.79	10.45
	1983	1755	72.22	11.01
Alg 30	1982	1566	74.61	12.49
	1983	1549	74.04	12.78
Geo-Trig 30	1982	1243	75.51	12.42
	1983	1192	74.91	13.04
Chem 30	1982	1006	74.29	11.95
	1983	959	73.66	12.14
Physics 30	1982	750	74.15	11.79
	1983	813	74.12	11.90
BSCS 30	1982	1009	72.91	10.86
	1983	927	71.79	10.82
French 30	1982	405	74.89	12.09
	1983	346	75.10	11.88
SS 30	1982	838	73.00	10.42
	1983	861	72.38	11.19
GPA[b] 12	1982	1813	73.01	8.90
	1983	1819	72.59	9.10

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools (English, Algebra, Geometry-Trigonometry, Chemistry, Physics, BSCS Biology, French, Social Studies).

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

Table 3

Percentage of Saskatchewan High School Graduates Whose Grade Fall Within the Designated Category for Selected Courses by Faculty (1982)

			Grade Category					
Course[a]	Faculty[b]	N	0-49	50-59	60-69	70-79	80-89	90+
Eng 30A	Ed	224		10.3	25.0	38.8	21.4	4.5
N=1336	En	103		0.0	15.5	42.7	34.0	7.8
	A	602		7.6	23.4	33.4	30.4	5.1
	Sc	407		6.4	22.1	35.4	29.5	6.6
Eng 30B	Ed	217		8.8	28.1	37.8	21.2	4.1
N=1319	En	104		2.9	15.4	38.5	36.5	6.7
	A	595		6.6	22.2	35.6	29.7	5.9
	Sc	403		8.4	20.3	35.5	30.3	5.5
Alg 30	Ed	176		23.9	24.4	27.8	17.6	6.3
N=1219	En	106		0.0	5.7	20.8	45.3	28.3
	A	525	0.2	13.1	21.7	30.3	25.1	9.5
	Sc	412		3.4	12.9	30.6	34.0	19.2
Geo-Trig 30	Ed	123		17.9	30.1	29.3	16.3	6.5
N=1013	En	104		0.0	5.8	25.0	40.4	28.8
	A	378	0.5	11.4	23.5	26.5	27.8	10.3
	Sc	408		5.9	16.2	28.7	32.6	16.7
Chem 30	Ed	99		16.2	35.4	30.3	13.1	5.1
N=811	En	99		1.0	6.1	24.2	47.5	21.2
	A	300		13.0	23.7	31.0	25.0	7.3
	Sc	313		4.8	17.6	28.4	34.2	15.0
Physics 30	Ed	56		23.2	32.1	19.6	21.4	3.6
N=620	En	104		1.9	13.5	26.9	37.5	20.2
	A	197		16.8	23.9	33.5	19.3	6.6
	Sc	263		5.3	22.1	28.5	33.5	10.6

Table 3 (continued)

Course[a]	Faculty[b]	N	Grade Category					
			0-49	50-59	60-69	70-79	80-89	90+
BSCS 30	Ed	133		14.3	38.3	28.6	15.8	3.0
N=779	En	47		0.0	12.8	44.7	23.4	19.1
	A	354		11.0	22.9	38.7	22.3	5.1
	Sc	245		1.6	16.3	35.1	30.6	16.3
French 30	Ed	57		8.8	28.1	26.3	26.3	10.5
N=308	En	13		15.4	7.7	23.1	30.8	23.1
	A	159		7.5	20.8	26.4	32.7	12.6
	Sc	79		6.3	16.5	24.1	36.7	16.5
SS 30	Ed	98		3.1	36.7	34.7	22.4	3.1
N=567	En	44		0.0	9.1	29.5	50.0	11.4
	A	265		4.5	24.2	35.8	29.8	5.7
	Sc	160		3.8	23.8	31.9	29.4	11.3
GPA[c] 12	Ed	227		0.9	46.3	36.1	15.0	1.8
N=1350	En	106		0.0	1.9	48.1	41.5	8.5
	A	604		1.8	29.6	43.2	23.3	2.0
	Sc	413		0.2	23.5	40.2	29.5	6.5

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] Ed = Education; En = Engineering; A = Arts; Sc = Science

[c] GPA indicates the average of all (30 level) courses taken by Saskatchewan grade 12 graduates including courses which were not analyzed as individual courses in this study.

Other faculties have small numbers of students. Table 4 displays the same data for students intending to enter these faculties in 1983.

There is again remarkable consistency between 1982 and 1983 data. The percentage of education students in each grade category of English 30A and 30B is very similar from 1982 to 1983. Comparing frequency counts of subjects in Tables 3 and 4 with corresponding frequency counts in Table 2 illustrates the number of students who intend to enter the four faculties listed and inadvertently the number of students who do not intend to enter these faculties. For example, about 225 to 250 students intend to enter education whereas approximately 600 students intend to enter arts. Inspection of Tables 2 and 3 reveals information which could form the basis for comparisons between faculties. For example, the percentage of education students in the 50-59% range appears much higher than engineering and science and somewhat higher than arts entering students throughout the list of subjects. Conversely at the 80-89% or 90% + ranges, education entering student percentage representation in these categories is consistently lower than other faculties. Engineering students are consistently higher than other faculties; science students are higher than arts.

Frequency counts provide evidence of the number of students intending to enter who have completed the core academic high school courses. For example, 133 of 224 students who intend to enter education in 1982 have taken Biology 30 in high school.

The next logical comparison was faculty means in these high school courses (see Table 5). The pattern which was evident in

Table 4

Percentage of Saskatchewan High School Graduates Whose Grades Fall Within the Designated Category for Selected Courses by Faculty (1983)

			Grade Category					
Course[a]	Faculty[b]	N	0-49	50-59	60-69	70-79	80-89	90+
Eng 30A	Ed	253		11.1	26.5	36.4	22.1	4.0
N=1282	En	77		7.8	16.9	50.6	16.9	7.8
	A	608		6.7	23.4	36.0	26.5	7.4
	Sc	334		9.0	24.7	34.9	27.6	3.8
Eng 30B	Ed	250		9.6	29.2	32.4	24.0	4.8
N=1275	En	72		4.2	19.4	36.1	27.8	12.5
	A	611		6.9	22.4	32.6	30.1	8.0
	Sc	342	0.6	6.1	25.1	36.8	25.7	5.6
Alg 30	Ed	209		14.4	29.7	31.1	18.7	6.2
N=1193	En	77		0.0	6.5	16.9	37.7	39.0
	A	556		12.9	21.6	27.3	25.9	12.2
	Sc	351		4.8	20.2	21.4	32.5	21.1
Geo-Trig 30	Ed	136	1.5	19.9	22.1	28.7	22.1	5.9
N=967	En	76		0.0	3.9	21.1	32.9	42.1
	A	407	0.2	14.5	18.4	25.3	26.8	14.7
	Sc	348		8.3	18.7	29.3	25.9	17.8
Chem 30	Ed	131		14.5	33.6	32.8	15.3	3.8
N=762	En	70		1.4	5.7	15.7	41.4	35.7
	A	300	0.3	14.3	24.0	26.0	23.7	11.7
	Sc	261		2.7	19.2	33.0	30.7	14.6
Physics 30	Ed	88		18.2	34.1	30.7	13.6	3.4
N=681	En	74		0.0	6.8	29.7	32.4	31.1
	A	270		12.6	22.6	30.4	24.1	10.4
	Sc	249		6.4	19.7	30.1	31.3	12.4

Table 4 (continued)

Course[a]	Faculty[b]	N	Grade Category					
			0-49	50-59	60-69	70-79	80-89	90+
BSCS 30	Ed	154		12.3	32.5	37.7	14.9	2.6
N=672	En	15		0.0	6.7	33.3	33.3	26.7
	A	321		10.9	26.5	32.7	24.3	5.6
	Sc	182		4.4	11.5	33.0	38.5	12.6
French 30	Ed	49		4.1	26.5	32.7	24.5	12.2
N=266	En	6		16.7	33.3	50.0	0.0	0.0
	A	153		9.8	15.7	22.2	35.3	17.0
	Sc	58		6.9	20.7	41.4	15.5	15.5
SS 30	Ed	116		11.2	24.1	36.2	24.1	4.3
N=574	En	22		4.5	9.1	22.7	27.3	36.4
	A	283		6.4	19.4	35.0	29.3	9.9
	Sc	153	0.7	4.6	15.0	41.2	31.4	7.2
GPA[c] 12	Ed	256		2.0	41.8	40.6	14.5	1.2
N=1311	En	77		0.0	1.3	44.2	40.3	14.3
	A	625		1.8	29.3	40.3	23.4	5.3
	Sc	353		0.6	21.5	45.3	28.0	4.5

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] Ed = Education; En = Engineering; A = Arts; Sc = Science

[c] GPA indicates the average of all courses taken by grade 12 graduates including those which were not part of this study.

Table 5

Means of Selected High School Courses for Saskatchewan Graduates Applying to the University of Regina in 1982 and 1983 by Faculty

Course[a]		Faculty[b] Ed	En	A	Sc
Eng 30A	1982	72.67	77.37	74.25	74.69
	1983	72.17	74.35	74.42	73.57
Eng 30B	1982	72.50	76.92	74.70	74.60
	1983	72.92	76.28	75.03	73.82
Alg 30	1982	69.92	83.86	73.67	79.25
	1983	71.03	85.65	74.33	78.69
Geo-Trig 30	1982	69.93	83.55	74.43	77.95
	1983	70.71	85.91	74.87	77.08
Chem 30	1982	69.22	82.43	73.10	77.77
	1983	69.95	84.27	73.51	77.61
Physics 30	1982	69.04	80.32	71.32	76.29
	1983	69.52	83.39	73.77	76.58
BSCS 30	1982	69.43	78.75	72.81	78.45
	1983	70.21	83.53	72.55	77.98
French 30	1982	74.11	78.00	76.25	78.15
	1983	76.59	67.83	77.93	75.45
SS 30	1982	72.66	80.52	74.72	75.54
	1983	72.52	81.41	75.64	75.90
GPA[c] 12	1982	71.63	80.04	73.82	76.46
	1983	71.82	81.01	74.46	75.85

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] Ed = Education; En = Engineering; A = Arts; Sc = Science

[c] GPA indicates the of all courses taken by grade 12 graduates including those courses which were not part of the study.

Tables 3 and 4 becomes clearer upon inspection of Table 5. Mean scores of students intending to enter education are consistently below those of students intending to enter other faculties; engineering students, with the exception of English and French, were consistently higher than all other faculties; science students, with the exception of English and French, were consistently higher than arts students. However, all means of students intending to enter these four faculties were close to or above 70% (B range). Grade 12 average marks for engineering students were above 80% as were many of the course means; science students were just above 75%; and arts students just below 75%.

When the significance of the differences among the course means of students intending to enter education when compared to the other three faculties (Table 6) were examined, t-test results revealed significant differences between education means and the combined means of engineering, arts, and science students in all high school courses except English 30B in 1983 and French 30 (both years).

The significance of differences among course means of students intending to enter education and course means of individual faculties were then examined. Table 7 displays t-test results when education means were compared to engineering - all were significantly different except French 30 and English 30B (1983).

Table 8 compares t-test results between education and arts student means. With the exception of Physic 30 (1982) and Biology (1983) all mathematics and science mean scores were significantly different. Social Studies and French scores (excepting Social

Table 6

A Comparison of the means of Saskatchewan Graduates on Selected High School Courses Between Faculties of Choice (1982 and 1983)

Course[a]		N		Mean		S.D.		T	P (pooled)
		Ed	Other[b]	Ed	Other	Ed	Other		
Eng 30A	1982	225	1113	72.67	74.71	9.83	9.75	2.86	0.004*
	1983	253	1029	72.17	74.13	10.14	10.04	2.786	0.006*
Eng 30B	1982	218	1103	72.52	74.88	9.74	9.72	3.28	0.001*
	1983	250	1025	72.92	74.71	9.77	10.30	2.49	0.013
Alg 30	1982	177	1044	70.01	76.91	12.22	11.44	7.35	0.000*
	1983	209	984	71.03	76.77	11.18	12.26	6.24	0.000*
Geo-Trig 30	1982	124	891	70.02	77.11	11.76	11.58	6.38	0.000*
	1983	136	831	70.71	76.81	12.43	12.59	5.24	0.000*
Chem 30	1982	100	713	69.42	76.45	10.42	11.12	5.97	0.000*
	1983	131	631	69.95	76.40	9.81	11.55	5.96	0.000*
Physics 30	1982	57	565	69.05	75.30	11.17	11.04	4.07	0.000*
	1983	88	593	69.52	76.15	10.45	11.37	5.16	0.000*
BSCS 30	1982	134	647	69.43	75.40	9.83	10.20	6.20	0.000*
	1983	154	518	70.21	74.78	9.55	10.40	4.86	0.000*
French 30	1982	57	252	74.11	76.92	12.31	11.18	1.68	0.094
	1983	49	217	76.59	76.99	10.34	11.60	0.22	0.827
SS 30	1982	99	469	72.79	75.55	8.86	9.61	2.63	0.009*
	1983	116	458	72.52	76.00	10.19	10.08	3.32	0.001*
GPA C12	1982	228	1124	71.66	75.38	7.67	8.08	6.39	0.000*
	1983	256	1055	71.82	75.41	7.09	8.23	6.42	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high school.

[b] Other = Engineering + Arts + Science

[c] Indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* p .01

Table 7

A Comparison of Means of Saskatchewan Graduates on Selected High School Courses for Education (Ed) vs Engineering (Eng) 1982 and 1983

Course[a]		N		Mean		Ed/Eng	
		Ed	En	Ed	En	T	P
Eng 30A	1982	224	103	72.67	77.37	-4.26	0.000*
	1983	253	77	72.17	74.35	-1.65	0.100
Eng 30B	1982	217	104	72.50	76.92	-3.92	0.000*
	1983	250	72	72.92	76.28	-2.56	0.011
Alb 30	1982	176	106	69.92	83.86	-10.50	0.000*
	1983	209	77	71.03	85.65	-10.34	0.000*
Geo-Trig 30	1982	123	104	69.93	83.55	-9.73	0.000*
	1983	136	76	70.71	85.91	-9.34	0.000*
Chem 30	1982	99	99	69.22	82.43	-9.67	0.000*
	1983	131	70	69.95	84.27	-10.12	0.000*
Physics 30	1982	56	104	69.04	80.32	-6.69	0.000*
	1983	88	74	69.52	83.39	-8.83	0.000*
BSCS 30	1982	133	47	69.43	78.74	-5.80	0.000*
	1983	154	15	70.21	83.53	-5.20	0.000*
French 30	1982	57	13	74.11	78.00	-1.02	0.310
	1983	49	6	76.59	67.83	1.99	0.052
SS 30	1982	98	44	72.66	80.52	-5.20	0.000*
	1983	116	22	72.52	81.41	-3.65	0.000*
GPA[b] 12	1982	227	106	71.63	80.04	-9.81	0.000*
	1983	256	77	71.82	81.01	-10.06	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

Table 8

A Comparison of Means of Saskatchewan Graduates on Selected High School Courses for Education (Ed) vs Arts (A) 1982 and 1983

Course[a]		N		Mean		Ed/Arts	
		Ed	A	Ed	A	T	P
Eng 30A	1982	224	602	72.67	74.25	-2.04	0.042
	1983	253	608	72.17	74.42	-2.97	0.003*
Eng 30B	1982	217	595	72.50	74.70	-2.86	0.005*
	1983	250	611	72.92	75.03	-2.78	0.006*
Alg 30	1982	176	525	69.92	73.67	-3.62	0.000*
	1983	209	556	71.03	74.33	-3.34	0.000*
Geo-Trig 30	1982	123	378	69.93	74.43	-3.62	0.000*
	1983	136	407	70.71	74.87	-3.28	0.001*
Chem 30	1982	99	300	69.22	73.10	-3.05	0.002*
	1983	131	300	69.95	73.51	-2.94	0.003*
Physics 30	1982	56	197	69.04	71.32	-1.36	0.174
	1983	88	270	69.52	73.77	-3.10	0.002*
BSCS 30	1982	133	354	69.43	72.81	-3.31	0.001*
	1983	154	321	70.21	72.55	-2.38	0.018
French 30	1982	57	159	74.11	76.25	-1.22	0.225
	1983	49	153	76.59	77.93	0.72	0.473
SS 30	1982	98	265	72.66	74.72	-1.90	0.058
	1983	116	283	72.52	75.64	-2.78	0.006*
GPA[b] 12	1982	227	604	71.63	73.82	-3.58	0.000*
	1983	256	625	71.82	74.46	-4.46	0.000*

[a] These are the abbreviated names of the standard Grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by Grade 12 graduates including those courses which were not part of this study.

* $p < .01$

Studies 30, 1983) were not significantly different whereas English 30 scores (excepting English 30A, 1982) were significantly different.

Table 9 compares the means of students intending to enter education and science. Significant differences are obvious in all science and mathematics courses and Social Studies 30 (1983) as well as grade 12 average. There were no significant differences in any of the English or French course means or in Social Studies 30 (1982).

Although significant differences among students intending to enter selected faculties at the University of Regina could not be identified, the SPSS ANOVA program was employed for multiple classification analysis. Thus, Table 10 provides another way of viewing the differences of student course means by faculty from the grand mean. It is noteworthy that all education course means fall below the grand mean in a range from French 30 (1983), -0.32 to Chemistry 30 (1982), -6.35. Mathematics and science scores average more than 5 points below the grand mean; overall grade point average for these education means averages 3 points below the grand mean.

Engineering student means (excepting French 30, 1983) are consistently above the grand mean, typically more than 5 points higher. Science student means follow this pattern (excepting lower English 30 scores) but are closer to the grand mean. Arts entering student means are close to the grand mean in general.

The final component of the analysis for this project involved male/female and rural/urban comparisons. These factors were examined using analysis of variance and multiple classification analysis.

Table 9

A Comparison of Means of Saskatchewan Graduates on Selected High School Courses for Education (Ed) vs Science (Sc) 1982 and 1983

Course[a]		N		Mean		Ed/Science	
		Ed	Sc	Ed	Sc	T	P
Eng 30A	1982	224	407	72.67	74.69	-2.48	0.013
	1983	253	344	72.17	73.57	-1.70	0.090
Eng 30B	1982	217	403	72.50	74.60	-2.51	0.012
	1983	250	342	72.92	73.82	-1.06	0.288
Alg 30	1982	176	412	69.92	79.25	-9.45	0.000*
	1983	209	351	71.03	78.69	-7.79	0.000*
Geo-Trig 30	1982	123	408	69.93	77.95	-6.97	0.000*
	1983	136	348	70.71	77.08	-5.21	0.000*
Chem 30	1982	99	313	69.22	77.77	-7.03	0.000*
	1983	131	261	69.95	77.61	-7.15	0.000*
Physics 30	1982	56	263	69.04	76.29	-4.59	0.000*
	1983	88	249	69.52	76.58	-5.25	0.000*
BSCS 30	1982	133	245	69.43	78.45	-8.62	0.000*
	1983	154	182	70.21	77.98	-7.40	0.000*
French 30	1982	57	79	74.11	78.15	-1.98	0.049
	1983	49	58	76.59	75.45	0.54	0.591
SS 30	1982	98	160	72.66	75.54	-2.29	0.023
	1983	116	153	72.52	75.90	-2.81	0.005*
GPA[b] 12	1982	227	413	71.63	76.46	-7.33	0.000*
	1983	256	353	71.82	75.85	-6.55	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

Table 10

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Faculty (1982 and 1983)

Course[a]		F	P	Grand Mean	Deviation Ed[b]	N	En	N	A	N	Sc	N
Eng 30A	1982	5.72	0.001	74.36	-1.69	224	3.01	103	-.011	602	0.33	407
	1983	3.12	0.025	73.74	-1.57	253	0.61	77	0.68	608	-0.18	344
Eng 30B	1982	5.31	0.001	74.48	-1.98	217	2.44	104	0.22	595	0.12	403
	1983	3.72	0.011	74.36	-1.44	250	1.92	72	0.67	611	-0.54	342
Alg 30	1982	54.77	0.000	75.90	-5.98	176	7.96	106	-2.23	525	3.35	412
	1983	54.50	0.000	75.77	-4.73	209	9.88	77	-1.44	556	2.92	351
Geo-Trig 30	1982	33.61	0.000	76.24	-6.31	123	7.31	104	-1.81	378	1.71	408
	1983	27.08	0.000	75.95	-5.24	136	9.96	76	-1.08	407	1.13	348
Chem 30	1982	35.48	0.000	75.57	-6.35	99	6.86	99	-2.47	300	2.20	313
	1983	33.19	0.000	72.29	-5.34	131	8.98	70	-1.78	300	2.32	261
Physics 30	1982	23.57	0.000	74.73	-5.70	56	5.59	104	-3.41	197	1.56	263
	1983	24.71	0.000	75.30	-5.77	88	8.10	74	-1.52	270	1.28	249
BSCS 30	1982	31.40	0.000	74.36	-4.94	133	4.38	47	-1.55	354	4.08	245
	1983	24.16	0.000	73.73	-3.52	154	9.80	15	-1.18	321	4.25	182
French 30	1982	1.48	0.220	76.41	-2.31	57	1.59	13	-0.17	159	1.74	79
	1983	2.04	0.108	76.91	-0.32	49	-9.08	6	1.01	153	-1.47	58
SS 30	1982	7.37	0.000	75.05	-2.38	98	5.48	44	-0.33	265	0.50	160
	1983	5.94	0.001	75.30	-2.78	116	6.11	22	0.34	283	0.60	153
GPA[c] 12	1982	37.61	0.000	74.75	-3.11	227	5.29	106	-0.93	604	1.71	413
	1983	30.63	0.000	74.71	-2.89	256	6.31	77	-0.24	625	1.14	353

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] Ed = Education; En = Engineering; A = Arts; Sc = Science

[c] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

Table 11 compares male and female means for all Saskatchewan graduates who intended to enter Faculties of Education, Arts, Science, or Engineering in 1982 and 1983.

Nearly 1,000 female Saskatchewan graduates and somewhat more than 800 males applied to enter this university in 1982 and 1983. These proportions are similar for many high school courses although proportionally more males have grades recorded for Geometry-Trigonometry 30 and Physics 30 than females and this appears to be reversed for French 30. Female students scored significantly higher in high school English (English 30A and 30B) and overall grade 12 average but not in other subjects (excepting French 30, 1985).

When male and female means were compared for students intending to enter the Faculty of Education (see Table 12), female students scored significantly higher in English (males were about 5 points below the mean) and grade point average (males were more than 3 points below the mean). With the exception of French 30 (1983), male education students were generally below the mean and females above.

Examination of the variance of means of selected high school courses for students intending to enter engineering revealed few significant differences - those that were significant favored female engineering students (see Table 13).

Male-female comparisons of students intending to enter Faculties of Arts and Science demonstrated significant differences in English and overall grade 12 average and a small number of additional differences (see Tables 14 and 15), again almost always favoring females.

Table 11

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Gender for all Four Faculties (1982 and 1983)

Course[a]		Mean	Male N	Male Dev'n	Female N	Female Dev'n	M/F F	M/F P
Eng 30A	1982	72.48	810	-2.78	972	2.31	102.68	0.000*
	1983	71.85	804	-3.15	962	2.63	129.97	0.000*
Eng 30B	1982	72.79	805	-2.99	959	2.51	129.74	0.000*
	1983	72.21	791	-3.09	963	2.53	118.85	0.000*
Alg 30	1982	74.61	736	0.15	830	-0.13	-	-
	1983	74.04	723	0.10	825	-0.09	-	-
Geo-Trig 30	1982	75.51	625	-0.06	618	0.06	-	-
	1983	74.91	605	-0.41	586	0.43	-	-
Chem 30	1982	74.29	492	0.30	514	-0.28	-	-
	1983	73.66	467	0.77	492	-0.73	-	-
Physics 30	1982	74.15	479	0.00	271	0.01	-	-
	1983	74.12	497	0.39	315	-0.61	-	-
BSCS 30	1982	72.91	416	-0.50	593	0.35	-	-
	1983	71.80	362	-0.45	564	0.29	-	-
French 30	1982	74.89	104	-1.34	301	0.46	-	-
	1983	75.10	76	-3.00	270	0.84	6.41	-
SS 30	1982	73.00	355	-0.55	483	0.40	-	-
	1983	72.38	376	-0.78	485	0.60	3.82	-
GPA[b] 12	1982	73.01	826	-1.22	987	1.02	29.66	0.000*
	1983	72.59	825	-1.26	993	1.05	30.09	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 12

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Gender for the Faculty of Education (1982 and 1983)

Course[a]		Mean	Male N	Male Dev'n	Female N	Female Dev'n	M/F F	M/F P
Eng 30A	1982	72.67	54	-6.04	170	1.92	28.81	0.000*
	1983	72.15	61	-5.65	191	1.80	27.33	0.000*
Eng 30B	1982	72.50	52	-6.02	165	1.90	28.54	0.000*
	1983	72.86	59	-4.74	190	1.47	19.73	0.000*
Alg 30	1982	69.92	40	-2.02	136	0.59	0.89	0.346
	1983	71.03	47	-2.65	161	0.77	2.84	0.094
Geo-Trig 30	1982	69.93	30	-3.13	93	1.01	2.46	0.119
	1983	70.72	34	-3.81	101	1.28	4.19	0.043
Chem 30	1982	69.22	25	-2.06	74	0.70	1.66	0.201
	1983	69.95	33	-2.26	98	0.76	2.36	0.127
Physics 30	1982	69.04	21	-1.56	35	0.94	0.83	0.368
	1983	69.48	23	-0.87	64	0.31	0.14	0.712
BSCS 30	1982	69.43	35	-2.09	98	0.74	2.44	0.121
	1983	70.25	35	-2.60	118	0.77	2.10	0.125
French 30	1982	74.11	10	-6.31	47	1.34	3.42	0.070
	1983	76.59	4	1.16	45	-0.10	0.53	0.819
SS 30	1982	72.66	28	-2.95	70	1.18	5.63	0.020
	1983	72.52	32	-0.52	84	0.20	0.10	0.750
GPA[b] 12	1982	71.63	54	-3.30	173	1.03	14.57	0.000*
	1983	71.82	63	-3.22	192	1.06	18.24	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 13

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Gender for the Faculty of Engineering (1982 and 1983)

Course[a]		Mean	Male N	Male Dev'n	Female N	Female Dev'n	M/F F	M/F P
Eng 30A	1982	77.37	87	-1.23	16	6.69	15.65	0.000*
	1983	74.35	72	-0.53	5	7.65	-	-
Eng 30B	1982	76.92	88	-1.35	16	7.45	15.32	0.000*
	1983	76.28	67	-0.61	5	8.12	-	-
Alg 30	1982	83.86	90	-0.74	16	4.14	5.41	0.022
	1983	85.65	72	-0.33	5	4.75	-	-
Geo-Trig 30	1982	83.55	89	-0.46	15	2.72	-	-
	1983	85.91	71	-0.30	5	4.29	-	-
Chem 30	1982	82.43	84	-0.30	15	1.70	-	-
	1983	84.27	65	-0.12	5	1.53	-	-
Physics 30	1982	80.32	88	-0.20	16	1.12	-	-
	1983	83.39	70	-0.18	4	3.11	-	-
BSCS 30	1982	78.74	39	0.33	8	-1.62	-	-
	1983	83.53	12	0.47	3	-1.87	-	-
French 30	1982	78.00	11	-1.55	2	8.50	-	-
	1983	67.83	5	-2.03	1	10.17	-	-
SS 30	1982	80.52	36	-1.22	8	5.48	6.08	0.018
	1983	81.41	21	0.50	1	-10.41	-	-
GPA[b] 12	1982	80.04	90	-0.68	16	3.84	7.39	0.008*
	1983	81.01	72	-0.26	5	3.79	-	-

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 14

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Gender for the Faculty of Arts (1982 and 1983)

Course[a]		Mean	Male N	Male Dev'n	Female N	Female Dev'n	M/F F	M/F P
Eng 30A	1982	74.25	237	-3.22	365	2.09	40.85	0.000*
	1983	74.42	249	-3.61	359	2.50	53.68	0.000*
Eng 30B	1982	74.70	236	-3.27	359	2.15	47.64	0.000*
	1983	75.03	250	-3.79	361	2.63	60.94	0.000*
Alg 30	1982	73.67	213	-0.85	312	0.58	-	-
	1983	74.33	228	-1.30	328	0.90	3.89	0.049
Geo-Trig 30	1982	74.43	164	-1.24	214	0.95	-	-
	1983	74.87	174	-1.92	233	1.43	7.13	0.008*
Chem 30	1982	73.10	116	-0.80	184	0.51	-	-
	1983	73.51	129	-1.36	171	1.03	-	-
Physics 30	1982	71.32	112	-0.69	85	0.92	-	-
	1983	73.77	137	-0.79	133	0.81	-	-
BSCS 30	1982	72.81	115	-1.18	239	0.57	-	-
	1983	72.55	115	-0.61	206	0.34	-	-
French 30	1982	76.25	31	0.79	128	-0.19	-	-
	1983	77.93	24	-2.43	129	0.45	-	-
SS 30	1982	74.72	94	0.69	171	-0.38	-	-
	1983	75.64	109	-2.29	174	1.43	9.43	0.002*
GPA[b] 12	1982	73.82	237	-1.83	367	1.18	21.39	0.000*
	1983	74.46	254	-2.26	371	1.54	32.32	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 15

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Gender for the Faculty of Science (1982 and 1983)

Course[a]		Mean	Male N	Male Dev'n	Female N	Female Dev'n	M/F F	M/F P
Eng 30A	1982	74.69	232	-2.23	175	2.95	30.23	0.000*
	1983	73.57	217	-2.73	127	4.66	53.25	0.000*
Eng 30B	1982	74.60	230	-2.56	173	3.41	38.65	0.000*
	1983	73.82	214	-2.06	128	3.45	24.26	0.000*
Alg 30	1982	79.25	236	-0.44	176	0.59	-	-
	1983	78.69	218	-0.67	133	1.10	-	-
Geo-Trig 30	1982	77.95	231	-0.57	177	0.75	-	-
	1983	77.08	219	-1.07	129	1.81	4.66	0.032
Chem 30	1982	77.77	181	-0.54	132	0.78	-	-
	1983	77.61	161	-0.06	100	0.10	-	-
Physics 30	1982	76.29	178	-0.71	85	1.50	-	-
	1983	76.58	175	-0.10	74	0.25	-	-
BSCS 30	1982	78.45	127	-0.69	118	0.74	-	-
	1983	77.98	99	-1.04	83	1.25	-	-
French 30	1982	78.15	26	-2.61	53	1.28	-	-
	1983	75.45	22	-1.77	36	1.08	-	-
SS 30	1982	75.54	88	-0.83	72	1.01	-	-
	1983	75.90	96	-1.54	57	2.60	7.31	0.008*
GPA[b] 12	1982	76.46	236	-1.22	177	1.63	13.06	0.000*
	1983	75.85	220	-1.31	133	2.17	17.27	0.000*

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Examination of rural-urban differences among Saskatchewan graduates who intend to enter the University of Regina involved ANOVA and Multiple Classification Analysis similar to the male-female comparison.

Table 16 displays the results of the comparison of the means of selected high school courses for all students entering Faculties of Education, Arts, Science, and Engineering.

It is worth noting that the University of Regina appears to draw a much greater number of urban students than rural students - at least when comparing students entering arts, science, engineering and education. Approximately 1,250 urban students applied to enter these faculties whereas about 570 rural students applied to enter in 1982 and 1983. The numbers for both years are similar - almost identical considering the size of the student population. In proportion more rural students have taken mathematics and science courses at the 30 level (excepting BSCS 30).

There are few significant differences between rural and urban student grades. Social Studies 30 is the only notable exception - favoring urban students. At the .05 level of significance English 30A course grades for 1982 and 1983 favor rural students.

Comparison of rural and urban students who intend to enter education is found in Table 17. Education appears to draw more rural students when compared to overall rural-urban proportion. With the exception of Algebra 30 (1983) favoring rural students, no significant rural-urban differences exist. Tables 18, 19, and 20 display rural-urban mean differences for Faculties of Engineering, Arts, and Science respectively. Few significant differences were evident.

Table 16

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Location (Rural vs Urban) for Four Faculties (1982 and 1983)

Course[a]		Mean	Rural N	Rural Dev'n	Urban N	Urban Dev'n	R/U F	R/U P
Eng 30A	1982	72.48	555	1.14	1227	-0.51	4.10	0.043
	1983	71.85	556	1.22	1210	-0.56	6.30	-
Eng 30B	1982	72.79	549	0.21	1215	-0.09	-	-
	1983	72.21	552	0.64	1202	-0.29	-	-
Alg 30	1982	74.61	496	0.38	1070	-0.17	-	-
	1983	74.04	495	0.44	1053	-0.21	-	-
Geo-Trig 30	1982	75.51	417	-0.83	826	0.42	-	-
	1983	74.91	405	-0.76	786	0.39	-	-
Chem 30	1982	74.29	325	-1.28	681	0.61	5.22	0.023
	1983	73.66	342	-0.92	617	0.51	-	-
Physics 30	1982	74.15	242	-1.01	508	0.48	-	-
	1983	74.12	266	-1.51	546	0.74	5.91	-
BSCS 30	1982	72.91	259	0.17	750	-0.06	-	-
	1983	71.80	243	0.44	683	-0.16	-	-
French 30	1982	74.89	128	-2.44	277	1.13	8.70	0.003*
	1983	75.10	116	-1.66	230	0.84	3.57	-
SS 30	1982	73.00	256	-1.61	582	0.71	9.78	0.002*
	1983	72.38	225	-1.35	636	0.48	5.05	-
GPA[b] 12	1982	73.01	564	-0.08	1249	0.04	-	-
	1983	72.59	571	0.02	1247	-0.01	-	-

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 17

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Location (Rural vs Urban) for Faculty of Education(1982 and 1983)

Course[a]		Mean	Rural N	Rural Dev'n	Urban N	Urban Dev'n	R/U F	R/U P
Eng 30A	1982	72.67	91	0.94	133	-0.64	0.47	0.829
	1983	72.15	94	1.05	158	-0.62	1.57	0.212
Eng 30B	1982	72.50	89	0.68	128	-0.47	0.74	0.931
	1983	72.86	94	0.82	155	-0.50	1.11	0.293
Alg 30	1982	69.92	73	1.39	103	-0.99	1.10	0.295
	1983	71.03	80	2.60	128	-1.62	6.58	0.011
Geo-Trig 30	1982	69.93	56	0.84	67	-0.70	0.19	0.664
	1983	70.72	64	0.58	71	-0.52	0.14	0.714
Chem 30	1982	69.22	44	-1.40	55	1.12	1.79	0.184
	1983	69.95	61	-0.17	70	0.15	0.65	0.799
Physics 30	1982	69.04	31	-0.26	25	0.32	0.24	0.626
	1983	69.48	38	0.75	49	-0.58	0.26	0.609
BSCS 30	1982	69.43	40	-0.65	93	0.28	0.57	0.451
	1983	70.25	39	1.41	114	-0.48	0.79	0.374
French 30	1982	74.11	25	-0.51	32	0.39	0.26	0.611
	1983	76.59	20	-0.04	29	0.03	0.12	0.972
SS 30	1982	72.66	31	-1.31	67	0.61	2.10	0.151
	1983	72.52	28	0.80	88	-0.26	0.22	0.643
GPA[b] 12	1982	71.63	92	-0.12	135	0.08	0.84	0.361
	1983	71.82	95	0.53	160	-0.31	0.82	0.365

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

- no significant difference

Table 18

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Location (Rural vs Urban) for Faculty of Engineering (1982 and 1983)

Course[a]		Mean	Rural N	Rural Dev'n	Urban N	Urban Dev'n	R/U F	R/U P
Eng 30A	1982	77.37	26	-1.64	77	0.55	-	-
	1983	74.35	24	-1.48	53	0.67	-	-
Eng 30B	1982	76.92	26	-0.62	78	0.21	-	-
	1983	76.28	23	-1.41	49	0.66	-	-
Alg 30	1982	83.86	27	-2.53	79	0.86		-
	1983	85.65	24	-1.69	53	0.77	-	-
Geo-Trig 30	1982	83.55	27	-1.62	77	0.57	-	-
	1983	85.91	24	-2.70	52	1.25	-	-
Chem 30	1982	82.43	25	-2.51	74	0.85	-	-
	1983	84.27	20	-0.92	50	0.37	-	-
Physics 30	1982	80.32	26	-2.86	78	0.95	-	-
	1983	83.39	23	-3.04	51	1.37	-	-
BSCS 30	1982	78.74	14	-0.24	33	0.10	-	-
	1983	83.53	8	0.72	7	-0.82	-	-
French 30	1982	78.00	4	-2.75	9	1.22	-	-
	1983	67.83	1	-13.83	5	2.77	-	-
SS 30	1982	80.52	14	-1.09	30	0.51	-	-
	1983	81.41	4	1.34	18	-0.30	-	-
GPA[b] 12	1982	80.04	27	-1.74	79	0.60	-	-
	1983	81.01	24	-2.26	53	1.02	-	-

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

- no significant difference

Table 19

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Location (Rural vs Urban) for Faculty of Arts (1982 and 1983)

Course[a]		Mean	Rural N	Rural Dev'n	Urban N	Urban Dev'n	R/U F	R/U P
Eng 30A	1982	74.25	159	2.42	443	-0.87	10.42	0.001*
	1983	74.42	147	2.64	461	-0.84	9.24	0.002*
Eng 30B	1982	74.70	156	0.61	439	-0.22	-	-
	1983	75.03	146	1.67	465	-0.52	-	-
Alg 30	1982	73.67	141	0.78	384	-0.29	-	-
	1983	74.33	136	0.68	420	-0.22	-	-
Geo-Trig 30	1982	74.43	111	-0.48	267	0.20	-	-
	1983	74.87	106	-0.15	301	0.05	-	-
Chem 30	1982	73.10	84	0.19	214	-0.08	-	-
	1983	73.51	90	-1.62	210	0.69	-	-
Physics 30	1982	71.32	60	0.26	137	-0.12	-	-
	1983	73.77	73	-2.86	197	1.06	7.25	0.008*
BSCS 30	1982	72.81	81	0.28	273	-0.08	-	-
	1983	72.55	63	1.74	258	-0.42	-	-
French 30	1982	76.25	40	-1.77	119	0.60	-	-
	1983	77.93	36	-0.98	117	0.30	-	-
SS 30	1982	74.72	66	-2.24	199	0.74	5.13	-
	1983	75.64	52	-0.39	231	0.09	-	-
GPA[b] 12	1982	73.82	160	0.29	444	-0.11	-	-
	1983	74.46	151	0.43	474	-0.14	-	-

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Table 20

A Comparison of Variance of Means of Saskatchewan Graduates on Selected High School Courses by Location (Rural vs Urban) for Faculty of Science (1982 and 1983)

Course[a]		Mean	Rural N	Rural Dev'n	Urban N	Urban Dev'n	R/U F	R/U P
Eng 30A	1982	74.69	125	-0.07	282	0.03	-	-
	1983	73.57	106	0.40	238	-0.18	-	-
Eng 30B	1982	74.60	125	-0.64	278	0.29	-	-
	1983	73.82	104	0.61	238	-0.27	-	-
Alg 30	1982	79.25	127	0.07	285	-0.03	-	-
	1983	78.69	110	-0.01	241	0.00	-	-
Geo-Trig 30	1982	77.95	125	-0.44	283	0.19	-	-
	1983	77.08	109	-0.35	239	0.16	-	-
Chem 30	1982	77.77	94	-2.55	219	1.09	7.89	0.005*
	1983	77.61	79	0.46	182	-0.20	-	-
Physics 30	1982	76.29	71	-0.90	192	0.33	-	-
	1983	76.58	78	0.26	171	-0.12	-	-
BSCS 30	1982	78.45	64	-1.56	181	0.55	-	-
	1983	77.98	45	-1.87	137	0.62	-	-
French 30	1982	78.15	15	-2.82	64	0.66	-	-
	1983	75.45	18	-4.39	40	1.98	-	-
SS 30	1982	75.54	44	-2.93	116	1.11	-	-
	1983	75.90	35	-2.98	118	0.88	-	-
GPA[b] 12	1982	76.46	127	-0.75	286	0.33	-	-
	1983	75.85	111	-0.22	242	0.10	-	-

[a] These are the abbreviated names of the standard grade 12 courses in Saskatchewan high schools.

[b] GPA indicates the average of all courses taken by grade 12 graduates including those courses which were not part of this study.

* $p < .01$

- no significant difference

Chapter V

DISCUSSION

This study intended to investigate demographic and academic performance information about students who planned to enter selected faculties at the University of Regina in 1982 and 1983. Such information could provide a baseline for further research activity which might attempt to profile students as they move through university and pursue careers. The study was designed to begin to establish a Canadian data base which permits comparison of the performance of students who enter various university faculties. The intent of the project was to determine whether generalizations made in an American context had relevance in Canadian education.

The results of this study at the University of Regina tended to confirm some of the general trends discussed in literature originating in the United States. However, some interesting local demographics and nuances in academic performance deserve discussion. For example, given the average number of new students who received student numbers as an indication of their intent to enter this university in fall semesters 1982 and 1983 (3,000 to 3,500 per year), about 1,750 to 1,800 of these are Saskatchewan high school graduates whose mean twelfth grade average is about 73 percent.

There was close agreement or consistency in both numbers of students and their achievement in selected high school courses across the four faculties examined in both years of the study. For example, mean English 30 grades varied less than one percent between 1982 and

1983 for a total population of more than 1,750 students per year. Twelfth grade GPA (or average marks) of this population varied less than 0.5 % between 1982 and 1983 samples.

Comparisons of academic achievement among students who selected one of the four faculties studied agreed with results reported by Weaver (1984) that, although prior to 1970 no clear trend could be reported, evidence since that time has indicated that the academic performance of teacher applicants is below that of their peers. This result is confirmed by others (Koerven, 1963; Levin, 1980; Schlechty and Vance, 1982; Sykes, 1983; Vance and Schlechty, 1982).

More specifically, in this study it was found that there was a higher proportion of education students represented in the lower grade ranges (50-69 %) and a lower proportion of education students represented in the mid (70-79 %) and higher (80-100 %) grade ranges than in other faculties. For example, 35.2 % of education students had English 30 (1982) grades in the 50-69 % range compared with 15.5% for engineering, 31 % for arts, and 28.5 % for science students. Conversely, 25.9 % of education students had grades within the 80-100 % range compared with 41.8 % for engineering, 35.5 % for arts, and 36.1 % for science students in this grade range for English 30 (1982).

Several other patterns emerged from University of Regina data examined in this study. Overall grade 12 average marks of students intending to enter education were significantly lower than students intending to enter other faculties, whether comparisons grouped student data from other faculties or analyzed them separately. This

result corresponded to lower SAT scores in American studies where college-bound education applicants were compared with college-bound noneducation applicants (Vance and Schlechty, 1982).

There was some variability in differences when comparisons were made between grade 12 course grades and intended faculty. When English 30 grades of students intending to enter education were compared with those intending to enter other faculties, whether taken together or by individual faculty, the results were variable. Where differences were significant, education applicants scored lower in all cases. In the mathematics subjects (Algebra 30, Geometry-Trigonometry 30) all mean differences were significant and favored noneducation students. In the sciences (Chemistry 30, Physics 30, BSCS 30), all mean differences were significant, with the exception of Physics 30 (1983), when education and arts students were compared (Table 8, p. 27). No significant differences were found in French 30 grades. Except for the 1982 comparison between education and arts, and between education and science, all differences between students intending to enter other faculties were significant and in all cases education students scored lower.

Comparisons between male and female Saskatchewan high school graduates who intended to register in Faculties of Arts, Science, Education, and Engineering at the University of Regina (1982-1983) demonstrated that females in general scored higher than males--significantly higher in some instances (grade 12 average, English 30A and 30B)--whether they were education females, arts, science or engineering females. There were, perhaps surprisingly for

those who believe males are somehow favored in high school mathematics and sciences, no real differences between entering student mathematics or sciences mean scores. Differences in Social Studies 30 and English 30 always favored female university applicants.

Comparisons between rural and urban Saskatchewan high school graduates who intended to enter the University of Regina Faculties of Arts, Science, Education, or Engineering in 1982 and 1983 were encouraging for rural teachers, parents, and for Department of Education or SSTA officials who are concerned that rural students may be disadvantaged by an education in smaller, perhaps less well-equipped and staffed, rural high schools. Rural-urban differences were virtually non-existent. Significant differences which did result were not consistent from one year to the next (e.g., Physics 30 displayed a significant difference favoring urban students in 1983 but not 1982), perhaps with the exception of Social Studies 30. In general rural students intending to enter this university do not appear to have grade 12 marks which are significantly different than urban students' marks.

Chapter VI

CONCLUSION

The purpose of this study was to obtain academic and demographic data which could provide the basis for comparison of students who intended to enter Faculties of Education, Engineering, Arts, and Science at the University of Regina. Criticisms of the academic abilities of education students and teacher education institutions cited frequently in the more recent literature provided the stimulus to examine local Canadian data. Many similarities were found between current results and the American studies. Some unique conclusions are also indicated by the results.

Students who intended to enter the Faculty of Education at the University of Regina in 1982 and 1983 demonstrated lower overall academic performance, based on high school grade criteria, than students who intended to enter other faculties. However, overall grade point average marks and averages for selected high school subjects for all students, including education applicants, were above 70 % or B-level. Thus, students intending to enter teaching at the University of Regina demonstrate an above average level of academic achievement. However, the achievement statistics of education applicants are lower than their college-bound peers. If it is true, as Bowles and Levin (1968) and Guthrie (1971) contend, that competence in teaching requires a level of intellectual ability that is at least equal, if not superior, to that of the average college student, then some work remains in teacher selection and counselling.

Vance and Schlechty (1982) state that "those who suggest that academic ability is not related to competence in teaching are wrong". Brophy (1982) says that effective teaching requires highly complex tool skills related to planning, organization, and evaluation which tend to be drawn disproportionately from among the most academically able of those who teach. Given these research results and assuming all other variables are equal, demonstrated intellectual ability is an advantage in the classroom. Education faculties must consider this when developing selection criteria.

The demographic data from this study indicate that of the approximately 3,000 students that apply to enter the University of Regina each autumn about one-half are Saskatchewan graduates who appear, given average age, to have applied to enter within about one year after graduating from high school.

The University of Regina appears, given the consistency of results when comparing 1983 with 1982, to be attracting a reasonably homogeneous group of students to each of the four faculties selected for comparison in this study. Year to year results are virtually identical. Given this consistency, perhaps comparisons of groups approximately five years apart might reveal differences, if any exist.

Consistency in demographics between 1982 and 1983 is matched by consistency in student academic data. Whether overall average marks or subject marks are compared, one year could be used to predict the other for within- or between-faculty comparisons.

When specific subject area marks were compared, several regularities emerged. A greater number of significant differences

were found between education and noneducation applicants when mathematics and science mean scores were compared than when comparisons were made between English, Social Studies, and French mean scores.

Grade 12 average scores were highest for engineering students and lowest for education students. Marks of science applicants were higher than arts applicants. The same trend was also evident for individual subjects, with minor exceptions, whatever the grouped or independent analyses.

Certain gender differences were evident among students compared in this study. Saskatchewan female high school graduates who applied to enter the University of Regina tended to demonstrate higher academic achievement than males. There were no significant differences between male and female science and mathematics scores. Deviations of male education students were, with the exception of French 30 (1983), always lower than female education students. Similar trends existed in all other faculties. However, given the lower education mean scores, the males intending to enter education scored lowest overall.

Anticipated differences between academic performance of rural and urban students were not substantiated by the results of this study. Rural Saskatchewan high school graduates who intended to enter the University of Regina demonstrated academic records which did not differ significantly from urban high school graduates. The general perception that lack of facilities, equipment, and teacher specialists may result in lower performance among rural students should be

re-examined given results indicating similar levels of academic performance of rural and urban students who elect to enter this university.

The evidence from this study must be interpreted with a degree of caution. Although comparable data from the United States have provided the grist for "teacher bashing" in the popular press, the information base provided by these studies may be incomplete. It appears that academic criteria are important predictors of teacher success. However, it is possible, even likely, that additional nonacademic factors, which may be related to personality, could play an important role in teacher effectiveness.

The data accumulated as a result of this study represent the beginning of a series of studies which will attempt to compare students who actually enter various faculties--and remain to obtain degrees--and subsequently to examine in some detail academic and nonacademic factors which predict success in teaching. The counselling and selection implications appear to dictate the necessity of pursuing this line of research beyond academic factors to include an understanding of teacher characteristics. Such an understanding can only be gained through long-term (longitudinal) compilation and examination of academic and nonacademic information.

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